UNDERWATER SPELEOLOGY

OFFICIAL NEWSLETTER OF THE CAVE DIVING SECTION OF THE NATIONAL SPELEOLOGICAL SOCIETY

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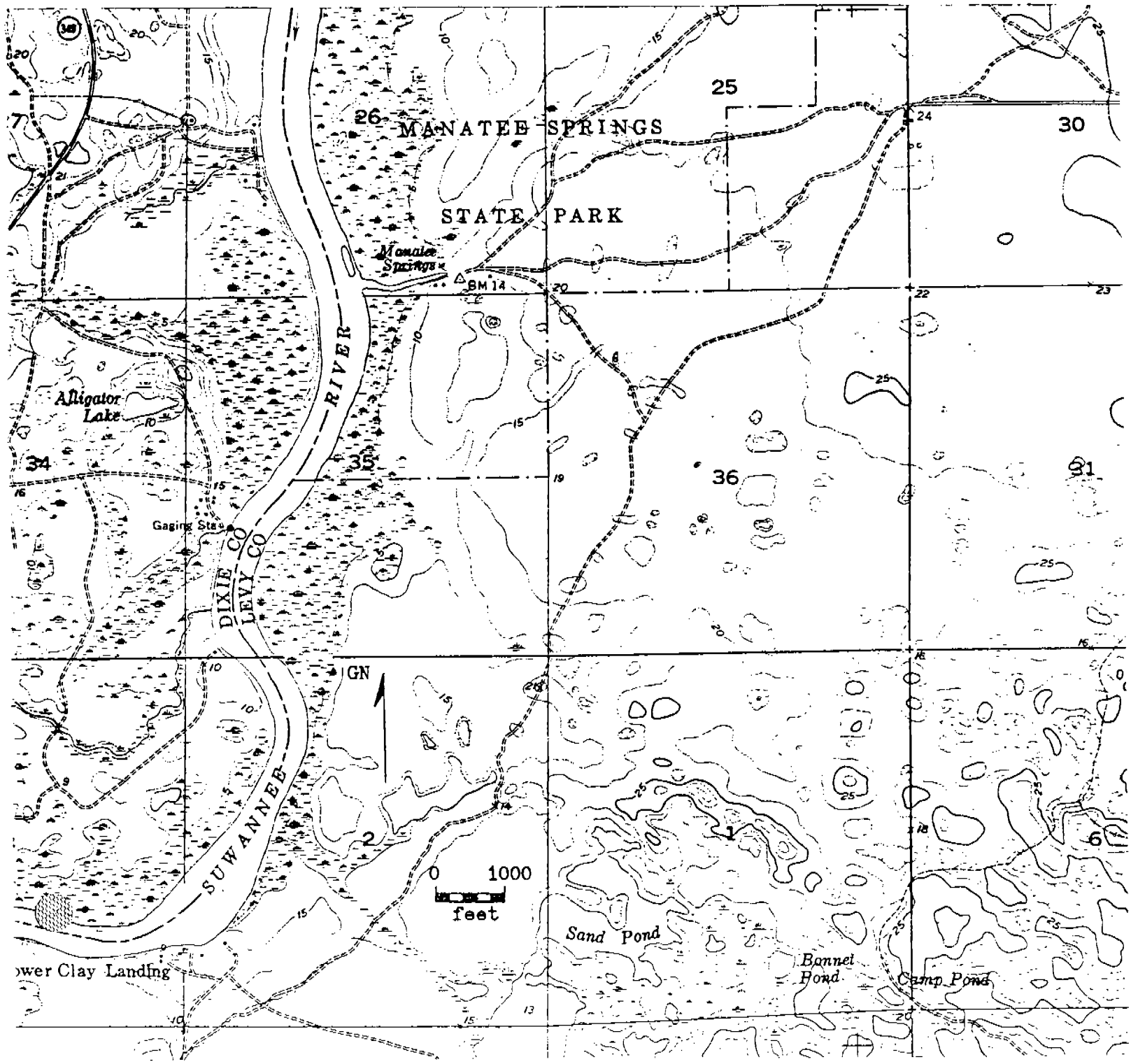


COVER MAP

The map is a 1:1 reproduction of the upper left hand corner of the Manatee Springs Quadrangle Map, 7.5 minute series of Florida; published in 1954. The contour interval is 5 feet.

BLANCHARD SPRINGS CAVERNS

You should consider visiting Blanchard Springs Caverns in the Ozark National Forest if you happen to be in Northern Arkansas. The visitor information center presents an interesting slide show before each cave tour. A feature of the show is a series of excellent cave diving pictures taken by our own Glenn Thompson (NSS 13478). Glenn and his buddies explored and mapped the submerged lower level of Blanchard Springs Caverns in 1971. Glenn had a contract with the National Forest Service to provide a map, water flow data and pictures. There is a plaque in the visitor center commemorating their exploration.

Sorry, no cave diving is allowed now.

An NSS "dry" caver is on display in an exibit showing animals associated with the caverns.

There are folk festivals (Anglo-Saxon type) in the area during the summer months, if you need another reason to travel into the Ozark mountains.

NEW MEMBERS

Tom H. Cook, 102 N. Main St., Farmington, N. H. 03835

Clarence Dillon, Park Square, Apt. 29A, Bloomington, Ind. 47401

Karan P. Exley, 1591 S. Lane Avenue, 118 Coventry, Jacksonville, Fla. 32210

John Kessler, OPS-ADP, FOCCPAC, F.P.O., San Francisco, Calif. 96617

Curtis H. Wheeler, 1407-A Lancewood Drive, Huntsville, Ala. 35805

ADDRESS CHANGE

William R. Owens new address, effective May 6, will be S. 4195 Big Bend Road, Waukesha, WI 53186

NEW SUBSCRIBERS

Mark D. Leonard, 4005 Meadows Drive, Apt. E2, Indianapolis, Ind. 46205

Richard A. Stocker, 2623 Davis Road, Indianapolis, Ind. 46239

Catherine E. Stice, 4033 Riverview Ave., Tampa, Fla. 33607

DIVER'S MEMORY

Alan Baddeley, director of the British Medical Research Council's Applied Psychology Unit, has an article in the February 13 issue of New Scientist which describes research concerning the psychological effects of the environment on the diver. The research suggests that there is an immediate drop in diver performance in cold water because the cold distracts the diver's attention from his task. Hypothermia, chilling of the body interior, was ruled out as a factor in the drop in diver efficency during the testing.

Anxiety may cause a decrease in dexterity performance. It may also produce a "context effect" on the diver. The training a diver receives on the surface may not transfer entirely underwater. The diver learning something on the surface will find it more difficult to recall underwater and vice versa.

PHOTOGRAPHY

The Underwater Photographic Society plans to discuss cave diving photography at its May meeting in Los Angeles, Calif. The discussion may evolve into some sort of published material on cave diving photography and/or a cave diving photographic course.

SILICONE WARNING

Do not use aerosol sprays on diving equipment if the sprays contain chlorinated solvents. Solvents such as chloroform and methylene chloride will attack Lexan and other plastics used in some types of diving equipment. Read the can label before using these sprays.

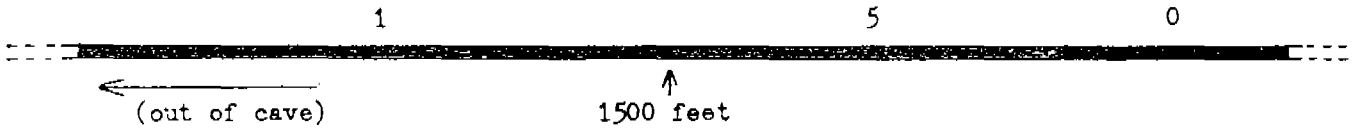
SAFETY LINE COLOR CODE

by Stephen D. Maegerlein (NSS 8340)

A pre-measured, color coded safety line may be used for mapping submerged cave passages. A versatile color code for marking the line is based on the electrical color code used for marking electrical resistors. Each digit is represented by a color as follows:

COLOR	CODE	COLOR	CODE
black	0	green	5
brown	1	blue	6
red	2	purple	7
orange	3	gray	8
yellow	4	white	9

The thousands, hundreds and tens decimals are represented by 3-inch, 2-inch and 1-inch bands respectively as shown below:



The footage mark is located at the boundary between the thousands and hundreds color bands. The long, thousands band is always nearest the cave entrance. Durable, easy to read color bands can be painted on braided nylon line with the bright colored enamels used for model boats and planes.

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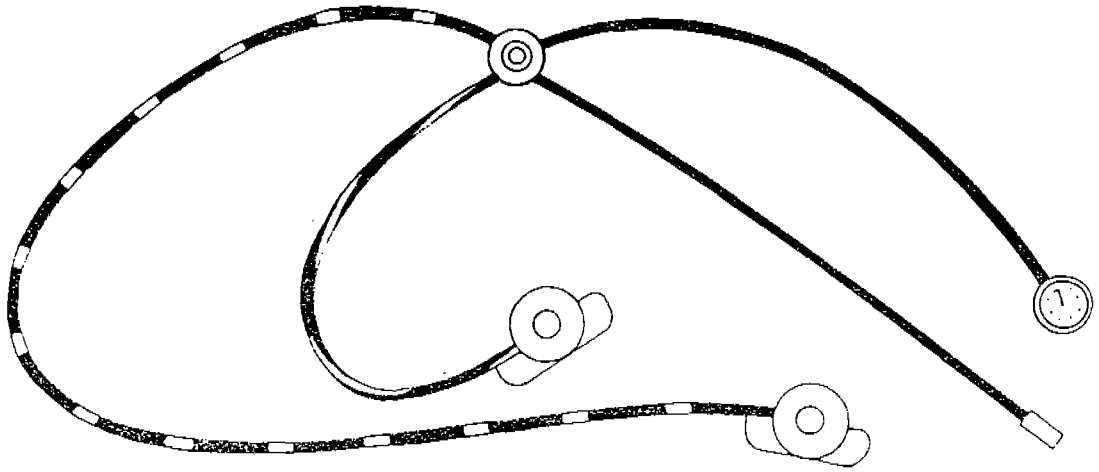
COLOR CODING OF REGULATOR HOSES

(adapted from an article by John Kessler (NSS 13411) in NAUI News)

The cave diver's single-hose regulator has become increasingly complicated as it has been made safer and more convenient. The regulator has evolved into the four hose, "single-hose" regulator, or more frequently termed a "quadrapus" regulator (see CDS Newsletter, Vol. 1, page 21). A diver in trouble needing air from his buddy or recovering his own regulator could easily confuse hoses in the shadows and silt during an emergency situation. He could not afford the time to sort through several look-a-like hoses. The confusion could be avoided by color coding one or more of the hoses. For example, the extra regulator with a five-foot hose could be banded with reflective tape. The regulator with the shorter hose could be spiral wrapped with tape as shown below. A light colored tape such as white or yellow would offer the greatest contrast on black hose. Dark code colors or a complex color code could cause more confusion. The color code configuration should be standardized within a diving team to avoid additional confusion.



MANATEE SPRINGS CAVE SYSTEM, FLORIDA

by Sheck Exley (NSS 13146)

Manatee Springs is a totally submerged cave system in many respects typical of those found beneath the waters of many of Florida's large springs. The cave consists of 5975 feet of passage explored thus far, making it the fifth longest cave in the state and the fourth longest underwater cave[1]. The spring itself has an average discharge of 181 cfs (9 measurements from 1932 to 1973)[2], making it the 9th largest of Florida's 22 first-magnitude springs.

Location

Manatee Springs is located in a state park of the same name approximately six miles WNW of Chiefland, the county seat of Levy County, Florida. The spring is clearly shown and labeled on the Manatee Springs Quadrangle in SW $\frac{1}{4}$, SE $\frac{1}{4}$, sec. 26, T. 11 S., R. 14 E. (see cover map, page 8). Access to the cave system is provided by five entrances, four of which are passable to cave divers. These include Manatee Springs, Catfish Hotel, Indian Pipe (impassable), Sue's Spring, and Friedman Sink. The entrances all occur along a fracture zone trending in a SE direction from Manatee Springs, the terminal outlet for the cave stream, to Friedman Sink approximately 2000 feet away.

Geohydrology

Manatee Springs Cave System has developed in the upper portion of the Gulf Hammock formation (Avon Park Limestone) of Eocene age. The primary structural control for the cave appears to be a series of joints with a strike of 135°. The water emerging from the spring is hard with 231 ppm dissolved solids[3], and is typical of that of many of Florida's springs.

General Description

The elevation of the water surface in the headpool of Manatee Springs is approximately 3 feet above mean sea level, and at least one portion of the cave extends down to a depth of 107 feet below sea level, or 110 feet below the water surface. There is no significant elevation of the water surface in the other four entrances. Manatee Springs itself is approximately 70 feet in diameter at the water surface, and flows through a broad run 50-100 feet wide about 0.2 mi. to the east bank of the Suwannee River. There are several entrances to the underwater cave system (see map on page 13). Catfish Hotel, the first entrance encountered upstream from the spring, is a large sink over 200 feet in diameter; Indian Pipe, the impassable opening immediately north of Sue's Spring, is six inches in diameter at the water surface; the other entrances fall somewhere in between Catfish Hotel and Indian Pipe in physical dimensions.

Depth of the headpool of the spring is 45 feet below the surface at the cave entrance, which is about 30 feet wide and ten feet high. The average width of the conduit beyond is 50 feet, with a ceiling height of about 15 feet, but the tremendous discharge of the spring creates severe currents that make exploration difficult under normal conditions. This high velocity current also picks up a considerable amount of red clay silt from the floor of the cave, limiting visibility to about 40 feet. As a matter of fact, most experienced cave divers avoid caving in the system until the Suwannee River is at flood stage, at which time they encounter greatly diminished current and visibility occasionally approaching 100 feet. The average depth of the cave floor is about 85 feet below the water surface, although one section (not a breakout dome but a dissolved portion of the main passage) rises to 25 foot depth. Breakdown areas are frequently encountered, and the conduit itself is very irregular as it winds left and

right and up and down. There are several minor side passages including a number of unexplored leads, but the dimensions of the main passage as well as the magnitude of the flow appears virtually undiminished even at the limit of exploration to date, 2365 feet upstream from the last access point, Friedman Sink.

The run is very colorful with a variety of plants and fish, etc. At one time the spring was a favorite wintering ground for the manatee or sea cow, a large aquatic mammal that is famous for being mistaken for mermaids by superstitious sailors. However, the manatee is now threatened by extinction and has ceased migrating to all but a couple of Florida's springs, Blue Springs in Volusia Co. and Crystal River in Citrus Co. Inside the cave itself are many troglobitic crayfish, and catfish and freshwater eels can frequently be found within a few hundred feet of the nearest entrance.

History

It is obvious from the shell mounds in the vicinity and many artifacts of pottery, bone, and flint found near the entrances that Manatee Springs was well-known to the Indians. In 1528 Pamfilio de Narvaez landed just north of Tampa Bay with a force of 300 armored men and horses in search of gold. Soon after they landed they defeated a force of Timucuans led by Dulchanchellin just north of the Withlacoochee River in Citrus County. Only a fool makes the same mistake twice, so Dulchanchellin made peace with Narvaez, told him of gold in the province of Apalache farther north and offered to take the Spanish there. They crossed the Suwannee River near Manatee Springs. A Spanish clay jar in excellent condition was recovered by cave divers in the cave near Friedman Sink a few years ago that may well have been dropped into the spring by one of Narvaez' men.

One of the questions that always arises when discussing Florida's springs with their huge caves is whether or not they have ever been subjected to vadose processes. Inside the cave system at various points and as much as 2000 feet from the nearest entrance are extensive deposits of the remains of land-dwelling Pleistocene mammals. It seems inconceivable that these remains could have been "washed" back into the cave. Fortunately many of these deposits are still undisturbed and may be studied since the park property is protected by very strict antiquities laws and groups such as NSS and NACD discourage private collectors.

Exploration

Manatee Springs was probably first entered by cave divers in the late '50's. However, the first verified explorations in the cave were by teams led by Dave Desautels (NSS) and John Harper (NSS 8352). The first recorded traverse between two submerged cave entrances in Florida was first made in the cave, from Manatee Springs to Catfish Hotel in January, 1961. By 1969 these two entrances had been linked to Sue's Spring (named in honor of Sue Friedman, NSS 13216) by teams led by Bob Friedman (NSS 13215), who began a systematic survey of known passage to produce one of the earlier maps of an underwater cave. At this time the total passage explored in the system was about 2550 feet.

A big breakthrough permitting further exploration in the system happened on March 18, 1973, when the author investigated a high dome in the ceiling of the cave some 1300 feet upstream from Sue's Spring and saw a tiny hole scant inches in diameter with daylight coming through. Lewis Holtzendorff (NSS 14831) located this hole on the surface in a remote section of the park. On March 24, the author excavated the hole to a minimum diameter of three feet with the help of Holtzendorff, Court Smith (NSS 15394) and Dana Turner (NSS 15167), and named

it in honor of Bob Friedman. The same day Dave Desautels led the team that made the first physical connection between the new sink and Sue's Spring (surface to surface).

Using the new entrance, members of the NSS Cave Diving Section and NACD have been able to extend exploration to a distance of 2365 feet upstream from Friedman Sink. The most recent extension was by Holtzendorff and Smith on March 2, 1975, and plans are being made now to explore more passage. Most of the cavers involved feel that, before all of the exploration and mapping is complete, the system will probably total well over two miles. The cover map shows sinkholes in the area several miles to the southeast which may be a part of the system.

Diving Regulations

Thanks to the efforts of the Florida Skin Divers Association and the National Association for Cave Diving, cave diving is permitted in Manatee Springs State Park. There are, however, certain minimal regulations which are rigidly enforced by the park rangers to help prevent the possibility of accidents. These include:

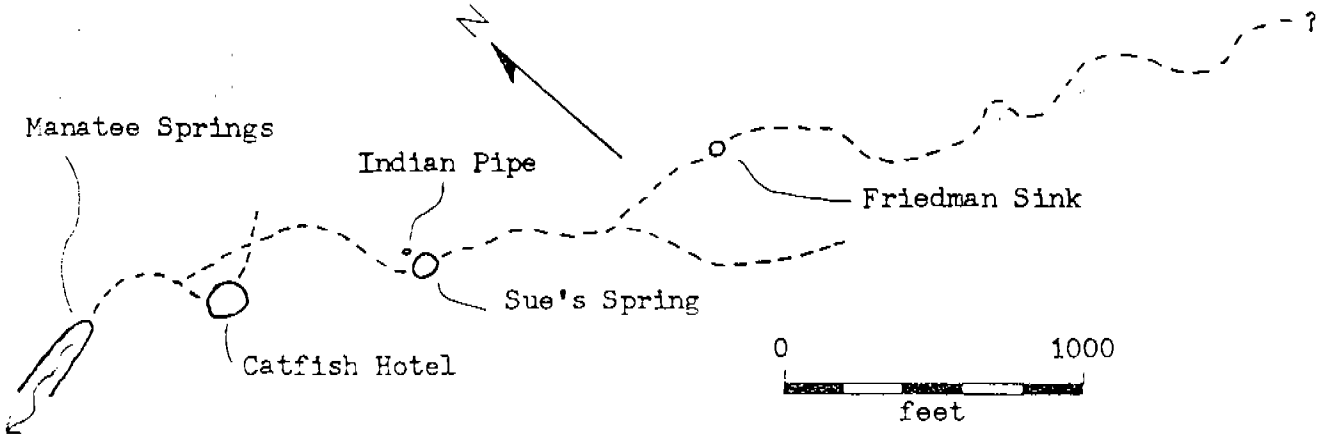
1. All divers must leave their certification cards with park authorities while making a cave dive.
2. Dives must be made in designated areas only (normally just Manatee Springs and Catfish Hotel unless special permission is obtained).
3. A dive group must consist of two or three divers.
4. There will be no more than three dive groups in the spring at any given time.
5. All divers must have a tank pressure gauge (sea view).
6. Each diver must have 1200 psi minimum.
7. Each diver must have one light and one knife.
8. There must be at least one watch and one depth gauge per dive group.
9. Use of safety line is strongly advised, but not required (there are permanent guidelines in the cave).

Cited References

1. NACD- NACD CAVE FILES, Gainesville, Florida

2. Rosenau, J.C., et.al.- An Index to Springs of Florida, Tallahassee, Florida: Bureau of Geology, 1974.

3. Ferguson, G.E., et.al.- Springs of Florida, Tallahassee, Florida: Florida Geological Survey, 1974, p. 107.



PLAN SKETCH, MANATEE SPRINGS CAVE SYSTEM, FLA.